PA-IOC

QUERY CONTROL FORM				RTIS USE ONLY	
Application No.	09/744,626	Prepared by	Lois Stone	Tracking Number	5911608
Examiner-GAU	Porta - 2878	Date	4/2/04	Week Date	3/1/04
		No. of queries	1	IFW	

JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION

a. Page Missing
b. Text Continuity
c. Holes through Data
d. Other Missing Text
e. Illegible Text
f. Duplicate Text
g. Brief Description
h. Sequence Listing
i. Appendix
j. Amendments
k. Other

CLAIMS

a. Claim(s) Missing
(b. Improper Dependency)
c. Duplicate Numbers
d. Incorrect Numbering
e. Index Disagrees
f. Punctuation
g. Amendments
h. Bracketing
i. Missing Text
j. Duplicate Text
k. Other

MESSAGE

Claim 17 (original claim 27) depends on claims 22, 25 and 26 (original claims 13, 16 and 24). Please advise.

Thank you,

initials LS

RESPONSE Claims have been renumbered. Please refer to the attached index of claims and the copy of the original and amended claims. Note the changes in claim dependency also. Thank you

C.S.

initials C.S.

Index of Claims

Application No.	Applicant(s)	
09/744,626	YAU LI, SAM FONG	
Examiner	**Art Unit**	
Christine Sung	2878	

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

Claim		Date
Final	Original	01/04
1	1	=
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17	9	=
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Issue Classification	Application No.	Applicant(s)	
	09/744,626	YAU LI, SAM FONG	
	Examiner	Art Unit	
	Christine Sung	2878	

ISSUE CLASSIFICATION

ORIGINAL						CROSS REFERENCE(S)							
CLASS				SUBCLASS		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
250				458.1		356	213						
INTERNATIONAL CLASSIFICATION													
G	0	1	T	1/10									
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Christine Sung 1/23/2004
(Assistant Examiner) (Date)

(Legal Instruments Examiner) (Date)

(Primary Examiner) (Date)

Total Claims Allowed: 40

O.G. Print Claim(s)	O.G. Print Fig.
1	1a

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	38	31		61		91		121		151		181
2	2	39	32		62		92		122		152		182
3	3	40	33		63		93		123		153		183
6	4	27	34		64		94		124		154		184
7	5	28	35		65		95		125		155		185
8	6	29	36		66		96		126		156		186
9	7	30	37		67		97		127		157		187
10	8	31	38		68		98		128		158		188
17	9	4	39		69		99		129		159		189
18	10	5	40		70		100		130		160		190
19	11	32	41		71		101		131		161		191
20	12		42		72		102		132		162		192
21	13		43		73		103		133		163		193
22	14		44		74		104		134		164		194
23	15		45		75		105		135		165		195
24	16		46		76		106		136		166		196
11	17		47		77		107		137		167		197
12	18		48		78		108		138		168		198
13	19		49		79		109		139		169		199
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14	21		51		81		111		141		171		201
15	22		52		82		112		142		172		202
16	23		53		83		113		143		173		203
25	24		54		84		114		144		174		204
26	25		55		85		115		145		175		205
33	26		56		86		116		146		176		206
34	27		57		87		117		147		177		207
35	28		58		88		118		148		178		208
36	29		59		89		119		149		179		209
37	30		60		90		120		150		180		210

Clm 1

e) at least one source radiation blocking panel, positioned between the source radiation focusing and collimating means and the sample, for blocking extraneous radiation of the beam of focused light and the emitted light, said panel having at least one pinhole wherethrough source radiation can pass, said pinhole provided in a position adjacent to the sample such that focused and collimated source radiation is directed onto the sample.

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2. (amended) An optical detection system according to claim 1 wherein the sample platform comprises at least one microfabricated channel, or a microfabricated array electrophoresis chip, or at least one capillary column, or at least one flow cell.

93 17

~~8.~~ (amended) An optical detection system according to claim 1 wherein a plurality of pinholes are disposed on the source radiation blocking panel at predetermined distances, said predetermined distance being the distance or a multiple of the distance between the samples arranged in an array.

94 22

~~14.~~ (amended)An optical detection system according to claim 1 wherein the emitted radiation focusing means comprises a convergent cylindrical rectangular lens.

23 22

~~15.~~ (amended)An optical detection system according to claim ~~14~~ wherein the source radiation blocking panel is provided with a plurality of pinholes.

Please cancel Claim 20.

Please amend Claims 21, 27 and 30 as follows:

95 14 11

~~21.~~ (amended) An optical detection system according to claim ~~17~~ further comprising a second emitted radiation blocking panel with at least one pinhole disposed between the second emitted radiation focusing means and the second photodetector, said pinhole wherethrough collimated second higher wavelength radiation can pass.

96 34 7, 17, 21, 24, 25

~~27.~~ (amended)An optical detection system according to claim ~~5, 9, 13, 16 or 24~~ wherein said source radiation blocking pan l is made of radiation absorbing material; and scanning means, connected to said source radiation blocking panel, are provided for shifting the source radiation blocking panel at pred termined distances and predetermined time intervals, said predetermined distance being the distance or a multiple of the distance between the different samples arranged in an array; and said predetermined time

interval being the time used to collect emitted radiation from each sample via said pinhole.

30. (amended)An optical detection system according to claim 1, ~~9, 13, 16 or 24~~ 17, 21, 25 wherein a plurality of pinholes are disposed on the source radiation blocking panel at predetermined distances, said predetermined distance being the distance or a multiple of the distance between the samples arranged in an array.

Please add Claim 41, as follows:

41. (newly added) An optical detection system according to claim 1, wherein the pinhole is movable relative to the source radiation focusing and collimating means and the sample platform.

original

CLAIMS

1. An optical detection system comprising :

a) at least one electromagnetic radiation source directing source radiation at a sample platform containing at least one sample;

b) at least one source radiation focusing and collimating means, positioned between the radiation source and the sample for focusing the directed source radiation onto the sample;

c) at least one photodetector adapted for receiving radiation emitted from the sample;

d) at least one emitted radiation focusing means, positioned between the photodetector and the sample, for focusing the emitted light onto the photodetector; and

e) at least one source radiation blocking panel, positioned between the excitation light focusing means and the sample, for blocking extraneous radiation, said panel having at least one pinhole wherethrough source radiation can pass, said pinhole provided in a position adjacent to the sample such that collimated source radiation is directed onto the sample.

2. An optical detection system according to claim 1 wherein the sample platform comprises at least one microfabricated channel, a microfabricated array electrophoresis chip, at least one capillary column, or at least one flow cell.

3. An optical detection system according to claim 1 wherein the sample platform is further connected to a power supply for electrophoresis or chromatography, such that optical detection can be performed concomitantly with electrophoresis or chromatography.

6. An optical detection system according to claim 1 wherein the sample platform is further connected to a pressure control system or a flow control system for chromatography, such that optical detection can be performed concomitantly with chromatography

7. An optical detection system according to claim 1 wherein

a dichroic beamsplitter, disposed between the source radiation focusing and collimating means and the photodetector, is provided for reflecting the source radiation onto the sample, and refracting the emitted radiation onto the photodetector;

the photodetector, the emitted radiation focusing means, the dichroic beamsplitter, the source radiation focusing and collimating means and the sample are arranged in a manner such that source radiation is focused onto said sample, and focused emitted radiation is collected by said photodetector;

the source radiation, comprising an excitation radiation, is directed at the dichroic beamsplitter; and

a long pass filter is disposed between the dichroic beamsplitter and the emitted radiation focusing means for preventing source radiation from reaching the photodetector, such that epi-flourescence detection is achieved.

6. An optical detection system according to claim 5 wherein the photodetector, the emitted radiation focusing means, the dichroic beamsplitter, the source radiation focusing and collimating means and the sample are disposed along one plane in this stated order.

7. An optical detection system according to claim 5 further comprising an interference filter provided between the dichroic beamsplitter and the radiation source for isolating a pre-set excitation wavelength.

8. An optical detection system according to claim 5 further comprising a rotatable filter wheel controlled by a rotor, said filter wheel, positioned between the photodetector and the long pass filter, for the transmission of emitted radiation of selected wavelengths from the sample to the photodetector.

9. An optical detection system according to claim 5 wherein a plurality of pinholes are disposed on the source radiation blocking panel at predetermined distances, said predetermined distance being the distance or a multiple of the distance between the samples arranged in an array.

10. An optical detection system according to claim 1 wherein

a plurality of directing means are provided to reflect, transmit and refract the source radiation at the sample from opposing first and second directions;

at least one pair of first and second pinholes provided on the source radiation blocking panel such that source radiation from the first direction can pass through the first pinhole into the sample, and

emitted light is emitted through the first pinhole, and source radiation from the second direction can pass through the second pinhole into the sample, and emitted light is emitted through the second pinhole; and

the source radiation focusing and collimating means comprises a first and second convergent cylindrical rectangular lens disposed across the path of the source radiation from said first and second directions respectively for focusing the source radiation onto the first and second pinholes.

19. An optical detection system according to claim ~~10~~ 18 wherein the plurality of directing means comprises a set of mirrors which split the source radiation into a first excitation wavelength in the first direction and a second excitation wavelength in the second direction.

20. An optical detection system according to claim ~~10~~ 18 wherein the plurality of directing means comprises a set of mirrors disposed at angles such that the first and second directions of radiation are both 45 degrees above the plane of the sample platform.

21. An optical detection system according to claim ~~10~~ 18 wherein

the sample platform comprises an array of channels aligned in parallel;

the blocking panel comprises a plurality of pairs of pinholes aligned longitudinally in a parallel array, each pair of pinholes positioned directly above a channel of the sample platform; and

the first and second convergent cylindrical rectangular lens focusing the source radiation from said first and second direction into a first color line and a second color line, said first color line directed at the row of first pinholes and said second color line directed at said row of second pinholes.

14. An optical detection system according to claim 5 wherein the emitted radiation focusing means comprises a convergent cylindrical rectangular lens.

15. An optical detection system according to claim 14 further comprising an emitted radiation blocking panel with pinholes provided between the emitted radiation focusing means and the photodetector.

16. An optical detection system according to claim 14 wherein an interference filter is provided between the dichroic beamsplitter and the radiation source for isolating a pre-set excitation wavelength.

17. An optical detection system according to claim 5 further comprising

a second dichroic beamsplitter, disposed between the dichroic beamsplitter and the long pass filter, for splitting the emitted radiation into a first wavelength radiation and a second higher wavelength radiation, such that said first wavelength radiation is reflected, and said second higher wavelength radiation is refracted to said long pass filter;

a second photodetector provided for receiving said first wavelength radiation reflected by said second dichroic beamsplitter; and

a second emitted radiation focusing means disposed between the second photodetector and the second dichroic beamsplitter for focusing said first wavelength radiation onto said second photodetector.

12 ~~18~~. An optical detection system according to claim 11 ~~17~~ further comprising an interference filter disposed between the dichroic beamsplitter and the radiation source for isolating a pre-set excitation wavelength.

~~19~~ 13. An optical detection system according to claim 11 ~~17~~ further comprising a second interference filter disposed between the second dichroic beamsplitter and the second photodetector for isolating a pre-set excitation wavelength.

~~20~~. An optical detection system according to claim 17 further comprising an emitted radiation blocking panel with at least one pinhole disposed between the emitted radiation focusing means and the photodetector, said pinhole wherethrough collimated emitted radiation can pass.

~~21~~. An optical detection system according to claim 20 further comprising an second emitted radiation blocking panel with at least one pinhole disposed between the second emitted radiation focusing means and the second photodetector, said pinhole wherethrough collimated second higher wavelength radiation can pass.

~~22~~. 15 An optical detection system according to claim 9 ~~17~~ further comprising a amplifier connected to said photodetector, and a second amplifier connected to said second photodetector.

16 15

23. An optical detection system according to claim 22 further comprising a computer or data processor connected to said amplifier, and a second computer or second data processor connected to said second amplifier.

24. An optical detection system according to claim 1 wherein said emitted radiation focusing means comprises 25

a first and second convergent cylindrical rectangular lens; and

an emitted radiation blocking panel with at least one pinhole;

said first convergent cylindrical rectangular lens proximate said sample platform for collecting radiation emitting from said sample platform and focusing said emitted radiation onto said second convergent cylindrical rectangular lens, said second convergent cylindrical rectangular lens directing said focused light onto said photodetector via said pinhole of said emitted radiation blocking panel.

26 25

25. An optical detection system according to claim 24 wherein the emitted radiation is transmitted radiation not absorbed by sample.

9, 17, 21, 24, 25

26. An optical detection system according to claim 1, ~~5, 9, 13, 16 or 24~~ 33 wherein the source radiation blocking panel is made of a radiation absorbing material and further comprises a plurality of pinholes which are disposed above each of said samples.

27. An optical detection system according to claim ~~5, 9, 13, 16 or 24~~ wherein said source radiation blocking panel is made of radiation

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abosrobing material; and scanning means, connected to said source radiation blocking panel, are provided for shifting the source radiation blocking panel at predetermined distances and predetermined time intervals, said predetermined distance being the distance or a multiple of the distance between the different samples arranged in an array; and said predetermined time interval being the time used to collect emitted radiation from each sample via said pinhole.

28. (35) An optical detection system according to claim 1, ~~5, 9, 13, 16 or 24~~ 7, 17, 21, 24, 25 wherein the source radiation focusing and collimating means is a convergent cylindrical rectangular lens.

29. (36) An optical detection system according to claim 1, ~~5, 9, 13 or 16~~ 7, 17, 21, 24 wherein the emitted radiation focusing means is a convergent cylindrical rectangular lens.

30. An optical detection system according to claim 1, ~~9, 13, 16 or 24~~ wherein a plurality of pinholes are disposed on the excitation blocking panel at predetermined distances, said predetermined distance being the distance or a multiple of the distance between the samples arranged in an array.

31. (38) An optical detection system according to claim 1, ~~5, 9, 13 or 16~~ 7, 17, 21, 24 wherein the source radiation is excitation light and the emitted radiation is fluorescence light.

32. (39) An optical detection system according to any one of claims 1, ~~5, 9, 13,~~ ~~16 or 24~~ 7, 17, 21, 24, 25, wherein the photodetector is connected to an amplifier.

1, 7, 17, 21, 24, 25

33. An optical detection system according to any one of claims ~~1, 5, 9, 13,~~ 40 ~~16 or 24~~ wherein the photodetector is connected to a computer or a data processor.

34. An optical detection system according to claim 1 wherein the radiation 27 source comprises a laser lamp, mercury lamp, xenon lamp or deuterium lamp.

35. An optical detection system according to claim 1 wherein the photodetector 28 comprises at least one photodiode, a photodiode array, a photomultiplier tube or a charge couple device.

36. An optical detection system according to claim 1 wherein the pinholes 29 ~~are circular, and the diameter of the pinhole range between 1 to~~ 1,000μm.

37. An optical detection system according to claim 1 wherein the pinholes 30 are rectangular in shape with the sides of the rectangle within 1 to 1,000μm.

38. An optical detection system according to claim 1 wherein the emitted 31 radiation focusing means is a convex lens.

39. An optical detection system according to claim 3 wherein the plurality 4 of channels or columns are longitudinally aligned.

40. An optical detection system according to claim ~~39~~ 4 wherein the plurality 5 of channels or columns are longitudinally aligned in parallel along one plane.

Add AS